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Lattimer-Stevens
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The Lattimer-Stevens Company

Company Member American Gas Association

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New York Representative:
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100 Park Place, New York

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We will be looking for you at the A. G. A. Convention Atlantic City October 13-17

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ROOTS

See your New Station Meter at the A. G. A. Convention Atlantic City, Booths 144-145

Inspect the perfected Instrument Combinations that we have developed for you

ROOTS Positive Displacement Gas Meter combines the good points of many other meters into one, giving you the most serviceable meter on the market.
The cost of a Roots Meter is only a fraction of that asked for other meters of corresponding accuracy.
ROOTS Meters are simply constructed and easily operated. You are not restricted to capacity limits, while care in regard to water levels and corrosion is eliminated.
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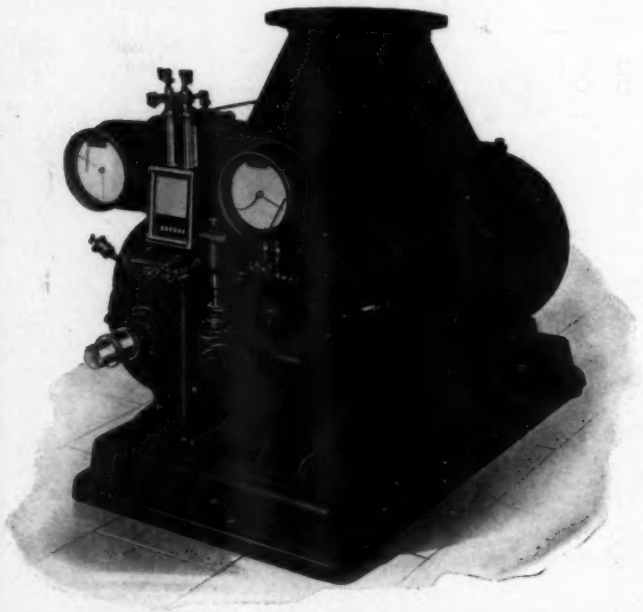

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The P. H. & F. M. ROOTS CO.

CHICAGO
Peoples Gas Building

CONNERSVILLE, INDIANA

CLEVELAND
1576 Union Trust Bldg.

NEW YORK
120 Liberty Street

AMERICAN
GAS JOURNAL

Vol. 121. No. 14 NEW YORK, OCTOBER 4, 1924 Whole No. 3484

Sell Winter Home Comfort Before You Sell Gas Heaters

A few suggestions of timely interest

Ernest A. Dench

WHAT are you planning to do this autumn to promote the sale of gas heaters in your town?

You are interested more, of course, in increased gas consumption, yet this objective cannot be attained unless you stage a timely sales drive on gas heaters.

And even then, before you can hope to dispose of gas heaters in large numbers, you are faced with selling the idea of the comfortable winter home.

Of the three links in the gas company's scheme of things, winter home comforts rank first.

Show Windows Should Radiate Winter Comfort

Make your show windows radiate winter comfort in the home. You appeal to the eye, and even the most unimaginative person cannot fail to get your point if it is well done.

Take a room, or even a nook in a typical American home, furnish it as such, and permit the gas heater to be just one vital part of it. The necessary furniniture and furnishings can easily be borrowed from a local furniture dealer, if you accord him publicity on a window card. We have yet to know of a furniture retailer who has failed to take advantage of such a co-operative proposition when it has been put up to him.

The most common mistake made by some gas companies today is devoting their windows to gas heaters; they are trying to sell this merchandise like such staples as sugar and coffee. Gas heaters must be sold in a different manner and with due consideration of the competition in the field.

The Cosy Living Room

A perfect model of the winter home comforts type of window was devised and executed last autumn by S. E. Choquette, sales manager for the Blackstone Valley Gas and Electric Co., Pawtucket, R. I. It represented a cosy living room, backed with rich brown plush draperies, with a charming pastoral painting hung near the top center. Below the painting a large mahogany fireplace was set in position. At each end of the mantelpiece was a tasteful piece of bric-a-brac, while a mahogany mantel clock was placed in the central position. The inside of the fireplace was built with red bricks in a red tiling effect, produced, by the way, with painted beaver board.

Here a gas log fire threw out a mellowish glow, thanks to the additional assistance of an orange spotlight from above. Andirons provided the finishing touch to the fireplace setting. On a rich rug a safe distance away from the gas log fire a little girl (a large doll, nicely dressed, and with exquisite features) was playing with a set of A. B. C. blocks. By each side of the fireplace was an upholstered chair, the kind that a person could relax in during his or her leisure hours. Behind each chair was a floor lamp with an artistic shade, lighted at night. In another part of the room a little gate-leg table, pleasingly arranged with an opened copy of a popular magazine and a vase of cut flowers.

Display Received Highest Honors

This was one of a large number of windows by local stores entered in the Fall Window Contest, sponsored by the Retail Merchants' Division of the Pawtucket Chamber of Commerce. Largely because of its originality and public interest, this gas heater trim was accorded the highest honors. The silver loving cup captured by Mr. Choquette was keenly contested, inasmuch as it was given to the decorator of the best window in the contest, irrespective of classification.

A Collie Seeks the Warm Place

Another excellent display, suggestive of winter

home comforts, was staged by the Brooklyn Borough Gas Co., Brooklyn, N. Y. The appearance of a substantially-built living room was obtained by enclosing the rear and sides with painted beaver board in a brown grained effect. A framed picture of a happy farmer boy hung from the central division. Then came the simulated fireplace of a dull-toned hue. Overhanging the mantelpiece were branches of autumn foliage. Of course, no mantelpiece is complete without a few well-chosen arti-

Hinting at Living Room Warmth

Public Service, Newark, N. J., only hinted at living room warmth in their show window facing the street car terminal, but it was sufficiently well done to interest the thousands of passers-by. The rear center held a large fumed oak mantelpiece, with a tiled fireplace erected inside it. At the middle of the mantelpiece a homey touch was introduced by a green pottery vase filled with autumn flowers. A

A Gas Heater Display That Won a Prize

cles, so in this case there was a brass candlestick (minus a wax candle) at each end. A radiantfire type of gas heater was set in the fireplace opening. This was lighted, while the ruddy glow was enhanced by red crepe paper behind the heater. Stretched out on the rich carpet in front of the fire was the life-size cardboard cut-out of a full-grown collie. Domestic animals instinctively turn toward warm places on cold days, so this suggested how warm the heater made the room. At the right end of the trim was a library table, with a pretty gas lamp on it. On the seat of the chair, partly drawn up to the table, was the copy of a magazine.

gas log fire fitted perfectly into the fireplace, lighted, of course. Grouped about the nut-brown plush-draped floor over stained oak stands were all types of gas heaters, with a spray of autumn foliage set on top of each article. Branches of autumn foliage and loose leaves in all the vivid hues. Throughout the window orange cards in black script advanced such arguments as those that follow:

"Save the coal pile early this fall and in winter

(Continued on page 913)

*Open House Week

A plan for public utilities

IT IS intended that Open House Week shall be a demonstration of service. Public utility service is the product of co-operative effort on the part of a departmentalized organization, each portion of which operates as a unit in harmony with every other portion. Therefore Open House Week should be worked out with the heads of every department and each should be urged to contribute something of interest and value.

Open House Week should be made the subject of a special conference under the direction of the manager. He should explain to his organization what he wishes to accomplish, and invite suggestions. Someone in the administrative or commercial department should then be placed in charge of the entire effort and made responsible for seeing it to a successful conclusion. All the various groups would report to him as they work out their several contributions.

Periodical meetings of department heads should be held where progress would be reported and ideas developed to be used in publicity and advertising.

As soon as you have decided that you wish to undertake this effort, the local manager, or the individual put in charge by him, should endeavor to stimulate civic interest and support in the plan. It should be explained to the city editor and advertising manager of each local newspaper, the mayor, the secretary of the Chamber of Commerce, the head of the real estate board, principal of the high school, bankers and the program directors of influential local clubs. The majority of these will be glad to give their support, and no doubt some valuable suggestions would be forthcoming.

Preparing the Property for Open House Week

The first thing to think about in preparing the plant and offices to receive visitors is cleaning up wherever necessary. Most gas and electric plants today take great pride in keeping their premises in a condition that will permit them to receive visitors at any time. Most offices are bright and well lighted with fixtures of modern design. To whatever extent this applies in your case, you will derive a direct benefit.

Arrangements should be made in such a way that visitors can be shown through without confusion or loss of time. It ought to be possible to arrange three or four complete tours of inspection a day, including time needed on each one for a brief discussion. A fixed route for all visitors covering plant, shop and offices should be laid out and each operation should have a placard or poster explaining the important points in order to facilitate movement and eliminate non-essentials.

An Explanation of Utility Service

Following a tour of inspection, before the visitors are dismissed, they should be seated at a convenient spot where their guide or some other official can give them a short talk on those aspects of public utility service which cannot be exhibited or demonstrated. A model for this talk is included in this pamphlet. It tells about the organization which maintains service, makes repairs, keeps the meters accurate, tests pressure, and sees that the distribution system stays air tight. It also tells about public utility financing, regulation, expansions. etc.

It would be very desirable in every case where possible to present each guest with a booklet of some sort, or souvenir fitting to the occasion. This might be a discussion of utility service, or a pamphlet of selected recipes, a toy for children, a ruler or pencil with your advertising, a child's bank, or anything else that will appeal.

As a background for this talk, it might be of value to have some charts prepared showing, for instance, a map of the distribution system, a graph illustrating the growth of your city and the corresponding growth of your service. A third might show how your investment in the city has increased, in dollars, and how your money is spent for labor, taxes, materials, etc. These charts can be made locally at small cost.

How to Handle the Publicity for Open House Week

The measure of success of your Open House Week program will depend largely upon publicity. The simplest and most economical suggestion, provided there is no one in the utility organization personally familiar with publicity methods, would be to employ a local newspaper man at part time to handle it for you. He could be obtained at a very nominal cost and would be most valuable in presenting your ideas in a manner in which your consumers are accustomed to receive them. His suggestions will be valuable in distinguishing between that part of your program which belongs in the news columns and that which should go into paid advertising. He should be employed well in advance of the week itself so that he can prepare an adequate supply of informative material as needed.

This newspaper publicity should touch the following points:

1—How long your company has been rendering continuous service.

2—Descriptive articles about your old employees, and what you do to train the younger ones.

3—How your business changed in the past twenty-five years.

(Continued on page 906)

*Prepared by Michigan Public Utility Information Bureau.

The Workings of a Gas Company

Public relations, service and sales of Pacific Gas & Electric Co.

Charles W. Geiger

THE Pacific Gas & Electric Company has long recognized the soundness of the theory that the major function of a public utility is one of service to society. It has also recognized the fact that commodity sales are a vital factor in the success of all industry and that the disposition of the commodity is poorly made unless it has been sold with a view of rendering a real service to the consuming public. For upon the degree to which the public is adequately served depends the future progress of the industry. Accordingly, in its organization plan, the Department of Public Relations and Sales has general supervision and charge of public relations and service, sales, publicity and commercial activities, throughout its entire territory.

In recognition of the inter-relation and interdependence of service and sales, the company, during the year 1923, organized and placed in effect a definite service sales program, its main purpose being to develop progressively and coincidentally both service and sales, to the end that the consumer might be assured maximum use and value of the commodity served. Some of the interesting features of this program follow.

Organizing the Employees in the Plan

Each regular employee of the company has been provided with a complaint and prospect booklet which is used for reporting promptly to the particular divisional office concerned any complaint or prospective business which may come to his attention in his contact with the consumer. The complaint or prospect slip, as the case may be, is signed by the employee, and provides a record by which the activity of any particular employee may be appropriately acknowledged. As a result of this method, a great many pieces of prospective business have been secured which would otherwise have been either lost or delayed. This has also proven true in the case of complaints and has resulted in bringing to the company's attention a great many instances where improvements in service could be made. Many of the complaints were more or less minor in their character, and could have reached the company through no other source.

Correcting Complaints

Special attention is given to the correction of complaints reaching the company through any and all channels, and a system of follow-up has been inaugurated. Service complaints unattended are a prolific source of unfavorable public relations, but when expeditiously corrected and followed up to assure the complete satisfaction of the consumer, offer an excellent opportunity for improved public relations. Results from the complaint and prospect booklets and the systematic follow-up have been most gratifying.

Circularizing the Customers

During the year a great number of the company's consumers were circularized with a letter expressing the company's appreciation of their business, defining its service and calling attention to the engineering assistance which the company maintains to improve the efficient use of its commodities. This was followed by a systematic canvass in which such engineering assistance was placed at the consumers' disposal. This has given very excellent results both in service and sales.

San Jose Gas Works, Pacific Coast Gas & Elec. Co.

In an endeavor to ascertain what the company's existing consumers thought of the service being rendered them by the company, return postal cards were mailed to all consumers, in which they were asked whether the service being rendered was satisfactory, and, if not, their suggestions for improvement were requested. They were also encouraged to advise the company of any complaints that were made that had not been given prompt and proper

(Continued on page 914)

INDUSTRIAL GAS LESSONS

IF IT'S DONE WITH HEAT — YOU CAN DO IT BETTER WITH GAS

Lesson No. 40

Expansion Effect of Heat (continued)

Example of Calculation in Which Pressure of Atmosphere Is Used

An example is taken of an ordinary gas line, the flow of gas being read in an ordinary meter and a mercury gauge being connected on the line. The gauge reads a difference of one and one-half inches of mercury, and atmospheric pressure is determined at that time to be 27.5 inches of mercury. It is required to convert the volume of gas read off the meter, namely 2,000 cubic feet, into standard terms, that is, 30 inches of mercury.

The absolute pressure of the gas will be 27.5 + 1.5 or 29 inches of mercury. The new pressure is 30 inches of mercury; therefore, the new volume must be less than the old volume as the pressure becomes greater. Hence, the new volume will be found by multiplying the old volume by a simple fraction, the numerator of which is less than the denominator, thus:

$$2{,}000 \times \frac{29}{30} \text{ or } 1{,}934 \text{ cubic feet.}$$

Gases Do Not Obey Gas Laws Under All Conditions

In all the examples, which have been discussed above, it is of course assumed that the temperature of the gas remains constant while the pressure is varying. It has also been tacitly assumed, both in the case of variation of volume with absolute temperature as the pressure remains constant, and variation of volume with pressure as the temperature remains constant, that all gases obey these laws as they have been written or expressed in mathematical terms. This is, however, not true, for some gases do not obey the laws except within narrow limits and all gases show variations when either the pressure or the temperature is brought to a very high or very low point. This is to be expected, for high pressure and low temperature are known to have a liquefying action on gases and vapors while high temperatures can readily cause some change in the gases or possible decomposition when they are not elements but chemical compounds.

Simultaneous Temperature and Pressure Variation

Under the conditions that are generally met with in practical work, neither the temperature nor the pressure remain constant while the other variable changes, but it is much more frequently the case that both pressure and temperature change. The volume, therefore, changes simultaneously with the variation in the pressure and in the temperature. Readings of pressure and temperature are taken at the time that the volume of the gas is determined, and then it is customary to reduce the volumetric readings to standard terms of pressure and temperature. Standard conditions are generally 30 inches of mercury and 60 degrees Fahrenheit and in all the calculations and discussions that follow in these lessons it will be understood that these figures are referred to, when standard conditions of volume mensuration are mentioned.

The calculation for both temperature and pressure change is simple and offers no more difficulty than the calculation of the volume change with pressure when the temperature remains stationary or of the volume change with temperature when the pressure stays constant. The general rules for calculation, which were developed above, are applied. The volume is multiplied by two fractions in the place of one fraction. It is not convenient first to calculate the volume change with pressure, and then to multiply this new volume by the fraction expressing the change due to the variation in the temperature.

Example of Calculation

A volume of gas is measured at 70 degrees F. and two inches of mercury pressure. The meter reading is 2,000 cubic feet. What is the volume of gas under standard conditions of temperature and pressure?

The pressure is 30 plus 2, or 32 inches of mercury. Standard pressure is 30 inches; hence the volume due to the pressure change is greater as the pressure becomes less. This means that the fraction will contain a numerator greater than the denominator, thus $\frac{32}{30}$. The temperature is 70 degrees, while normal temperature is 60 degrees. Therefore, the reduction in temperature connotes a reduction in volume, which means that the numerator of the fraction will be less than the denominator. The fraction will, therefore, have the following form:

$$\frac{60+460}{70+460}$$

The final calculation will, therefore, be as follows:

$$2000 \times \frac{32}{30} \times \frac{520}{530}, \text{ or } 1691 \text{ cubic feet.}$$

The same procedure is followed out in any calculation of change in volume due to variation in temperature or pressure, or both. All that it is necessary to remember is that the volume varies as the absolute and not as the normal temperature, and that the form of the fractions, which are used in multiplying the original volume of the gas, must be such as to produce a change in volume which corresponds to the noted variation in pressure and temperature. No formulae need be memorized, the effect of the pressure and temperature variation being figured out logically and applied mathematically by constructing the fraction in the proper manner.

OPEN HOUSE WEEK

(Continued from page 903)

4—How the company keeps ahead of community growth.

5—Some unusual and humanitarian uses for your service, as, for instance, in hospitals, public institutions, factories, etc., showing no demand too great or too small.

6—Articles on how to use your service in order to derive the greatest benefit therefrom, and how to avoid waste.

7—Something about how the company is financed, and what portion of the rate is turned back to the public in taxes.

Use should be made of pictures. The article about your old employees ought to be illustrated. Frequently photographs taken many years ago are available. Sometimes a picture series showing the young women who receive applications, adjust complaints or who hold unusual positions are found acceptable.

If your service has ever been seriously interrupted, by storm or fire, it would be interesting to tell how you handled the emergency. If you have attempted customer ownership activities you ought to tell about that.

All these things and more fit in with the Open House idea, since it is principally a throwing open of all the doors and an introduction to the family.

Suggestions for Exhibits and Window Displays

A gas stove of twenty-five years ago, with a placard telling what it cost and what it would and would not do as compared with present day models, also the rate in effect at that time and the cost of coal and labor.

A comparative arrangement of fuel, showing the average week's supply for a six-room house of anthracite, Pocahontas and gas coke, with the amount of ash produced by each and the costs in your city.

Distribution: Make a chart showing how distribution is taken care of in various lines of business. How the U. S. mail has a personal system, with one carrier serving scores of homes; how one milk route calls once a day and serves dozens of people; how grocery and department store distribution augments the delivery for those who do not carry home the articles used in their daily lives.

Then show how your distribution lines are laid, how they serve day and night, delivering energy in very small quantities as needed. Suggest how much different costs would be if your product could be delivered like groceries or milk, or if the latter had to be brought to the home when desired.

Proper and improper practices in using your service.

A prize essay contest, open to anyone, would stimulate thought. The subject suggested is, "If I had to go without one of our public services, which would it be, and why?" Letters should not exceed 500 words.

Give Out a Souvenir of the Visit

It will be desirable and tend to increase your attendance if you give each visitor a souvenir. The Public Utility Information Bureau, as stated elsewhere, has obtained samples and prices on such articles in quantity.

In addition, pamphlets on any subject connected with utility operation can be had. The national associations have issued many excellent ones and the Information Bureaus and schools have prepared more. If you would like your customers to learn, for instance, what is being done about farm electrification, superpower, elimination of smoke nuisances, house heating with gas, you can be supplied. Other discussions deal with regulation, franchises, the three-part rate, public ownership.

How to Attract Your Crowds

Each company will have its own methods of attracting its customers to the property inspections. Perhaps the most effective way is by display newspaper advertising. A personal invitation, prepared like a pass and sent out with bills, will also help. These methods are probably more effective than mimeographed form letters. If the invitation or pass should be a ticket for a prize drawing that would give it still greater value.

Invitations in person or by personal letter should go to organizations, such as luncheon clubs, women's study clubs, civic societies, high schools, parent-teacher clubs, granges, etc. A customer ownership day should be considered. If you have never had customer ownership activities, make it a day for holders of utility securities and include in your announcement people who hold life insurance policies and have savings accounts. Their funds are largely invested in utility securities.

As The Journal Views It

THE COMPENSATION OF GAS MEN

One of the most important matters that prevail in industry is the turnover of employees. Under certain conditions this may be very small; under other conditions it may be very large. When it is small it is found that either the industry is operating under very special conditions or else it is fortunate enough to possess a system of compensation which makes the employee anxious to retain his job and stay with his organization. Then, again, when the turnover is large, circumstances may be such as to make it impracticable for it to be otherwise, or else the method of compensating is at fault.

It may be stated as a general rule that no matter what the peculiar conditions are that make for large turnover, a considerable reduction can always be effected by devising a system of compensation that appeals to the employee and holds him in the organization.

Now it must not be misunderstood that a proper system of compensation means overpoyment of employees. This perhaps is just as bad, if not worse, than underpayment, but it does mean that each employee is compensated according to his value in the organization, and if he becomes more valuable his worth is recognized and he is rewarded accordingly. It is, of course, presupposed that the basic rate of salaries or wages is such as is equitable with living costs and the desire in every man to have something to spend for luxuries, and a little to put by for a rainy day.

The gas industry, particularly because of the strides it is making along industrial lines, is calling to its ranks men of marked ability, men who have vision, who can look into the future, and who can work to educate the consuming public as well as to sell it what their company manufactures or merchandises. Such men must be adequately compensated, and their compensation must be based on systems that provide for a reward when such is demanded by the character of the results obtained. The men must be encouraged to work for something definite. There must be a goal ahead of them. They must be made to realize that the gas field can compensate them better than any other field, if they have the proper ability to advance and get along. They must be convinced that in the gas field lies their life's work.

When such ideas are inculcated in the minds of the gas employees, and when the conditions under which they work are conducive toward the practical application of these ideas, then the turnover of men in the gas industry will become very small. In many instances individual companies, who manufacture and merchandise gas, possess organizations that have devised systems of compensation, the like of which are equalled by but a few of the other industries in the country. In other cases there is no real basis on which gas employees are compensated or on which they are advanced when advancement is called for.

The gas industry needs new men. It needs more and more of them, as it is growing and developing in the industrial field. It needs men who will give the best that is in them to the work, and the work is not easy, by any means. It needs men who can work out a problem that is perhaps as difficult as anything that can be presented to them, and finally obtain a solution for it.

There is a wide field for good men in the gas industry, but if the industry is to attract such men, and, more important, if it is to retain them, it must be prepared to offer them adequate compensation for their work, and also it must be ready to show them in a practical manner that when they deserve increase of compensation they will get it. There is nothing more detrimental to any industry than a constant resignation of men on whom much time and money have been spent to train them and make them fit for their positions. This can only be done away with when men are properly and adequately compensated.

*Rate Structure For Selling Gas

The difficulties of straight rates and the remedy

F. J. Schwab

New Orleans Public Service, Inc.

THE purpose of this paper is in no sense an attempt to prescribe any definite rates for selling gas, as a rate that might be ideal for one property would be totally out of line for another property. It is our purpose to present a collection of the best modern views heretofore published in connection with the making of proper rates for the sale of gas.

Into gas service enter many elements of cost which form the structure upon which rates must be based. The sale of gas is not alone the sale of the commodity measured in terms of cubic feet but requires a constant, never-ending and indispensable human attention known as "Service," which represents a major portion of the cost element and which is a fixed cost irrespective of the number of cubic feet of gas used by the customer. It is well to keep in mind, always, that the average gas customer is primarily interested in the service which he receives and not in the number of cubic feet of gas which he burns.

Difficulties of Straight Rate

One of the main difficulties with the gas business has been the attempt to apply a straight rate, based entirely upon consumption per thousand feet.

For the purposes of comparison, the gas and electric businesses may be used. The electrical business is one of the most progressive and most rapidly developing businesses in the whole country. One reason for its success has been the carefully adjusted system used, with the approval of regulatory commissions, by most of the larger electric light and power companies. They have had schedules of charges fitted to the needs of the different classes of customers, and as a result have undertaken intelligently to supply the various classes of their demand. No electric plant, of any size, has been operated upon the basis of a straight consumption charge to all customers regardless of the amount of their demand.

A different policy on the part of the gas companies has resulted in a severe limitation in the consumption of gas. The rates in most of the towns are so high as to preclude the use of gas for incidental or general heating, and many other purposes.

(It must, of course, be remembered that local conditions of special nature are directly responsible for comparatively high gas rates. This must be taken into consideration in criticising any gas rate.—Ed.)

The Industrial Gas Rate

Industrial consumers of gas fall into still another classification, and can not commercially use gas on a price that would be justified for cooking or heating purposes. The attempt of the transportation and distributing companies to charge a price for gas for industrial and heating purposes determined by the average cooking consumption results in driving such consumers from their lines. On the other hand, the cooking customers constitute a large proportion of their revenue, and to supply those customers on the heating or industrial basis would result in a loss of revenue that would be disastrous to the companies. Experience has amply demonstrated the correctness of this statement.

Principles Involved

The principles involved in a proper rate base have been generally neglected up to the last few years, and only since an earnest and intelligent effort has been made to adjust these rates on a basis that would serve the various classes of customers, with due regard to the cost of the service for each class, has any progress been made toward a reasonably permanent adjustment of this question.

A system of charging which permits any business to be carried at less than the cost to the company and prevents the acquisition of business which might be had on a profitable basis, means that the community pays more on a whole for service than would be required under a rational system of charging.

Customer Should Pay for Service

A system of charging that would tend to compel every consumer to pay all of the cost he occasioned is the proper system, according to the best authorities. Such a system would save the utility from doing business at a loss with any consumer. If not compelled to do business at a loss with any consumer, it would tend to make it possible for the utility to supply its profitable customers at a lower rate; in fact, this system of charging would bring the cost of service to the profitable consumers at a lower rate and would enable the utility to encourage more of the profitable business. Unless some new development is brought forward in this field of economics this will probably be the rate method towards which we will all eventually work.

The Three-Part Rate

A system of rates which has been developed to embody the foregoing ideas is commonly known as

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*Delivered at the convention of the Southwestern Public Service Association.

Catechism of Central Station Gas Engineering in the United States

Installment No. 40

(Continued from last week)

Ans. It is very desirable that the gas should reach the consumer at a uniform pressure, or a pressure as nearly uniform as it is possible to have it under working conditions, since unless this is the case he cannot get good results from his gas consuming appliances. If the loss of pressure in the street mains between the works and the consumer was always the same, the maintenance of a uniform pressure at the works would give a uniform pressure to the consumer, and there would be no necessity for regulating the pressure on the street mains except to reduce an excessive holder pressure. But the loss of pressure in the street mains varies with the rate at which gas is passing through them, being greater at the times of heavy consumption and smaller at times of light consumption. Consequently, if a uniform pressure were maintained at the works, the pressure at which the consumer received the gas would vary between more or less widely separated limits, while, by a proper regulation of the pressure at the works, the gas can be delivered to the majority of the consumers at a pressure that will be fairly uniform throughout the twenty-four hours of each day and from day to day. Besides giving a better service to the consumer the proper regulation of the pressure on the street mains reduces leakage by keeping the mains from being subjected to an excessive pressure during the time of light consumption, as would be the case if a uniform pressure, sufficient to meet the requirements of the time of heavy consumption, were maintained.

Calculating Amount of Gas Delivered by a Pipe

217. Give the formula from which to calculate the amount of gas that will be delivered by a pipe under given conditions of length and diameter of pipe, and specific gravity and pressure of gas. State the manner in which the formula was originally deduced.

Ans. The formula for calculating the flow of gas through circular pipes, whose length is more than 400 to 500 times their diameter, or in any case where the figure used for pressure is the difference between initial pressure at one point of the pipe, as, for instance, the outlet of district governor, and final pressure at another point, is, $Q = 1350\, d^2 \sqrt{\frac{pd}{sl}}$ in which

Q=Quantity of gas passing in cubic feet per hour.

d=diameter of pipe in inches.

p = loss of pressure in inches of water, that is, the difference between the pressure at the beginning and that at the end of the line of pipe through which the gas flows.

s=specific gravity of gas, air being taken as 1.000.

l=length of pipe in yards.

The formula is derived from the law of mechanics relating to the flow of fluids through pipes without friction, modified by well established facts as to the laws regulating the friction of fluids upon solids.

For flow without friction the law is that the velocity of such flow is dependent upon the pressure and is the same as would be acquired by a body falling through a height equal to that of a column of the fluid in question that would produce the given pressure. According to this $v^2 = 2g\frac{p}{S}$ or $p = \frac{S}{2g}v^2$ in which v=velocity in feet per second, g=the force of gravity=32.19, p=pressure in pounds per square foot under which the fluid is supplied to the pipe and S= the weight of a cubic foot of the fluid in pounds.

The Friction of Fluids

The facts in regard to the friction of fluids upon solids are as follows:

1. Such friction is independent of the hydrostatic pressure to which the fluid is subjected.
2. It is proportional to the area of the moving surface.
3. It varies with the velocity of the fluid. (While the exact ratio is not known, it is sufficiently accurate for practical purposes to assume that the friction varies as the square of the velocity.)
4. It may also be assumed to be proportional to the weight of the fluid, or its specific gravity.

These seem to be the only conditions affecting the friction provided the fluid be in a state of perfect fluidity and that the surface of the solid be so smooth as not to offer obstructions to the passage of the fluid along it.

Force of Friction and Formula

The force absorbed by friction according to these rules can be expressed by the equation $f = Ml'cSv^2$ in which M=a constant, called the coefficient of friction, to be determined by experiment, l'=length of pipe and c its circumference, both in feet, S=the weight of a cubic foot of the fluid in pounds and v= the velocity in feet per second. In the case of a pipe whose area equals a, if p' is the added pressure in pounds per square foot, the total force required to overcome friction will be ap', and as it also equals $Ml'cSv^2$ we have $ap' = Ml'cSv^2$ or $p' = Ml'\frac{c}{a}Sv_2$. This

pressure must be added to that required to produce a certain velocity without friction if the same velocity is to be maintained against friction. Therefore the total pressure necessary to produce motion and overcome friction will be

$$P=p+p'=\frac{s}{2g}v^2+Ml'\frac{c}{a}Sv^2 \text{ or}$$

$$P=\left(\frac{1}{2g}+Ml'\frac{c}{a}\right)Sv^2 \qquad (1)$$

With a circular pipe whose internal ditmeter is d_1, we have $c=3.1416d_1$ and $a=\frac{3.1416d_1^2}{4}$ or $\frac{c}{a}=\frac{4}{d_1}$

and substituting this and the known value 32.19 for g we have

$c=3.1416d_1$ and $a=\frac{3.1416d_1^2}{4}$ or $\frac{c}{a}=\frac{4}{d_1}$ and substituting this and the known value 32.19 for g we have

$$P=Sv^2\left(4M\frac{l'}{d_1}+0.0156\right) \qquad (2)$$

From various measurements of the quantity of fluid flowing from pipes under known conditions the value of M has been determined to be 0.0001 or $\frac{1}{10000}$. Substituting we have

$$P=Sv^2\left(\frac{l'}{2500d_1}+0.0156\right) \qquad (3)$$

For use in problems concerning the flow of illuminating gas this formula can be further modified. The pressure is generally expressed by the height in inches of an equivalent column of water. Representing this by p we have $P=62.5\frac{p}{12}=5.2p$. The weight of the gas is also generally expressed in terms of its specific gravity with reference to air. Calling this s then S= s × weight of a cubic foot of air (=0.0764). Substituting these values in equation (3) we have,

$$5.2p=v^2\times .0764s\left(\frac{l'}{2500d_1}+0.0156\right)=$$

$$v^2\times s\left(\frac{0.0764l'}{2500d_1}+0.001192\right)=$$

$$v^2\times s\left(\frac{0.0764l'+2.98d_1}{2500d_1}\right) \text{ or}$$

$$v^2=\frac{5.2p}{\frac{s(0.0764l'+2.98d_1)}{2500d_1}}=$$

$$\frac{5.2p\times 2500d_1}{s(0.0764l'+2.98d_1)}=\frac{13000pd_1}{s(0.0764l'+2.98d_1)}$$ and dividing both numerator and denominator of the fraction by 0.0764 we have $v^2=\frac{170157pd_1}{s(l'+39.0d_1)}$ and $v=412.5\sqrt{\frac{pd_1}{s(l'+39.0d_1)}}$ (4)

in which v=velocity of flow in feet per second; p=pressure in inches of water; s=specific gravity of gas with reference to air; l'=length of pipe in feet and d_1=diameter of pipe in feet.

But it is usually desired to know the quantity of gas passed per hour rather than the velocity per second, the diameter of the pipe is usually given in inches and it is more convenient to express the length in yards. Letting Q = quantity in cubic feet per hour, d=diameter in inches and l=length in yards we have,

Q=v × number of seconds in an hour × area of pipe=$v\times 3600\times 0.7854\,d_1^2$

$d=12d_1$, or $d_1=\frac{d}{12}$ and $Q=3600\,v\times 0.7854\left(\frac{d}{12}\right)^2=$

$19.63\,d^2v$ or $v=\frac{Q}{19.63d^2}$.

We also have $l'=3l$. Now substituting these values for v, d_1 and l' in equation (4) we have,

$$\frac{Q}{19.63d^2}=412.5\sqrt{\frac{p\frac{d}{12}}{s(3l+39.0\frac{d}{12})}} \text{ or}$$

$$Q=412.5\times 19.63d^2\sqrt{\frac{p\frac{d}{12}}{s(3l+39.0\frac{d}{12})}}=$$

$$412.5\times 19.63d^2\sqrt{\frac{\frac{pd}{12}}{\frac{s(36l+39.0d)}{12}}}=$$

$$412.5\times 19.63d^2\sqrt{\frac{pd}{s(36l+39.0d)}}=$$

$$412.5\times 19.63d^2\sqrt{\frac{1}{36}\times\frac{pd}{s(l+1.08d)}}=$$

$$412.5\times 19.63d^2\times\frac{1}{6}\sqrt{\frac{pd}{s(l+1.08d)}}=$$

$$1349.56d^2\sqrt{\frac{pd}{s(l+1.08d)}} \text{ or in round numbers}$$

$$Q=1350d^2\sqrt{\frac{pd}{s(l+1.08d)}}$$

Derivatives of the Quantity 1.08d.

The quantity of 1.08d is derived from the pressure required to give velocity to the gas as it enters the pipe, and where the pressure is taken after the gas has entered the pipe this must be dropped. In problems where the length of pipe is more than 400 to 500 times its diameter this quantity becomes relatively so small that it may be neglected and the equation taken as $Q=1350d^2\sqrt{\frac{pd}{sl}}$

In using this formula it must be borne in mind that it is based on the assumption that the pipe is smooth, straight and horizontal. Any sharp bends or obstructions in the pipe or sudden changes of area will decrease the delivery and therefore it is probable that in most cases this formula will give quanti-

ties slightly above the actual delivery for any line of pipe. But used intelligently it enables us to secure a close approximation to the delivery of any proposed line of pipe when the other quantities are known. Any difference in levels must be allowed for, of course. The student is referred to King's Treatise on Coal Gas, Vol. II, Part VIII, Chapter IV (page 374), from which the foregoing has been condensed.

A Gas Delivery Problem

218. If a 4 in. gas main will, under certain conditions of length of main, amount of pressure lost by friction and specific gravity of the gas, deliver 1,000 cubic feet of gas per hour, what amounts of gas will be delivered per hour under the same conditions by a 6 in. main and an 8 in. main respectively.

Ans. The formula by which the amount of gas flowing through pipes under different conditions can be calculated, as given in the answer to question No. 217, is,

$$Q = 1350d^2 \sqrt{\frac{pd}{sl}} = 1350 \sqrt{\frac{d^5p}{sl}}$$ in which Q is the number of cubic feet of gas delivered per hour, d is the diameter of the pipe in inches, p is the pressure required for overcoming the friction in the pipe, s is the specific gravity of the gas, and l is the length of pipe in yards. From this formula it will be seen that the amount of gas delivered will, everything else remaining the same, vary as the square root of the fifth power of the diameter of the pipe in inches. The fifth power of 4 is 1,024 and the square root of this is 32; the fifth power of 6 is 7,776 and the square root of this is 88.18, and the fifth power of 8 is 32,768, the square root of which is 181. Therefore, the carrying capacities of 4 in., 6 in. and 8 in. pipes are to each other, all other conditions being the same, as 32 to 88.18 to 181, or as 1 to 2.76 to 5.66. That is, if a 4 in. main will, under certain conditions of length, amount of pressure lost by friction and specific gravity of the gas, deliver 1,000 cubic feet of gas per hour, a 6 in. main will, under the same conditions, deliver 2,760 cubic feet per hour, and an 8 in. main 5,660 cubic feet per hour.

Solving It by the Gas Flow Computator

The problem can also be solved with a gas flow computer by setting the figure 4 on the diameter-of-pipe scale opposite the figure 1,000 on the cubic-feet-of-gas-per-hour scale and reading off on this latter scale the figures that stand opposite to 6 and 8 on the diameter-of-pipe scale.

The same relation holds for pipes of any diameters that are to each other in the ratio 4, 6 and 8, or, what is the same thing, the ratio 2, 3 and 4. Thus, a 12 in. pipe will carry 2.76 times and a 16 in. pipe 5.66 times as much gas as an 8 in. pipe.

Rate of Flow of Gas Through Pipes, Formula Used to Calculate Delivery

219. Calculate by means of the ordinary formula for the rate of flow of gas through pipes, the amount of gas that can be delivered per hour through one-half mile of 6 inch pipe with a loss of pressure of 5/10 inches, the specific gravity of the gas being 0.56.

Ans. The ordinary formula for the rate of flow of gas through a pipe of any size under given conditions of length of pipe, specific gravity of gas and amount of pressure lost in the pipe, as given in the answer to question No. 217, is,

$$Q = 1350d^2 \sqrt{\frac{dp}{sl}}$$, in which

Q = the volume of gas passed per hour in cubic feet,
d = the diameter of the pipe in inches,
p = the loss of pressure or head in inches of water,
s = the specific gravity of the gas, air being 1,000,
l = the length of the pipe in yards, and
1350 is a constant, the value of which has been determined by experiment.

In the problem given, the value of the different factors are:

$d = 6$ $\qquad$ $s = 0.56$

$p = \frac{5}{10}$ $\qquad$ $l = 880$

hence, substituting these values in the formula,

$$Q = 1350 \times 36 \sqrt{\frac{6 \times 0.5}{0.56 \times 880}} = 48{,}600 \sqrt{\frac{3.0}{492.8}} =$$

$48{,}600 \sqrt{0.00609} = 48{,}600 \times 0.078 = 3{,}790$ cubic feet.

While it is necessary that the student should know the formula for the flow of gas and be able to apply it, in practice the results which have been obtained above by calculation can be obtained much more easily and quickly by the use of a Gas-Flow Computer, which is a device of the slide-rule type by means of which the size of pipe required to deliver any given quantity of gas, or the quantity delivered by a pipe of any size, under any given conditions of length of pipe, loss of pressure and specific gravity of gas can be read off by making the proper adjustments of the various scales marked on the computer. The use of one of these computers enables all problems similar to the one above to be rapidly and quickly solved.

Calculation of Size of Pipe

220. It is desired to deliver 9,500 cubic feet of gas per hour through a pipe one mile long with a loss of pressure of 0.5 in. The specific gravity of the gas is 0.55. What size pipe will be required? Give your calculations.

Ans. The answer to question No. 217 gives the formula by which the amount of gas flowing through pipes under different conditions can be calculated. This formula is,

$$Q = 1350\, d^2 \sqrt{\frac{dp}{sl}}$$, or, as it is also written,

$$Q = 1350 \sqrt{\frac{d^5p}{sl}}$$, in which

Q = the number of cubic feet of gas delivered per hour,

d = the diameter of the pipe in inches,

p = the pressure, in inches of water, required for overcoming the friction in the pipe,

s = the specific gravity of the gas, air being 1.00, and

l = the length of the pipe in yards.

Squaring both sides of the equation, we have,

$$Q^2 = 1350^2 \frac{d^5 p}{sl}$$

Clearing of fractions gives

$Q^2 sl = 1350^2 d^5 p$,

and dividing both sides by $1350^2 p$

$$\frac{Q^2 sl}{1350^2 p} = d^5 \text{ or } d = \sqrt[5]{\frac{Q^2 sl}{1350^2 p}}$$

In the example given

Q = 9500

p = 0.5

s = 0.55 and

l = 1760 (1760 yards = 1 mile)

$$\text{so } d^5 = \frac{9500 \times 9500 \times 0.55 \times 1760}{1350 \times 1350 \times 0.5} = \frac{87{,}362{,}000{,}000}{911{,}250} =$$

95,870.5 and $d = \sqrt[5]{95{,}870.5}$.

The Use of Logarithms

To avoid having to perform the operation of extracting the 5th root the result can be reached by finding from a table of logarithms the logarithm of 95,870.5, dividing this logarithm by 5 and then finding the number for which this quotient is the logarithm The number so found is the desired 5th root. The logarithm of 95,870.5 is 4.9816850, and this divided by 5 is 0.9963370, the number corresponding to which is 9.916. Therefore, d = 9.916 in. and 10 in. pipe would be required.

Since the pipe chosen will be that of the standard size that is nearest to and larger than the exact size given by the formula, the result can also be reached by trial after finding the value of d^5. In the case in point, since 100,000 is the 5th power of 10, and 59,049 the 5th power of 9, it is evident that the 5th root of 95,870.5 is very near 10, and that therefore 10 in. pipe will be required.

The problem has been worked out above, since it is important to know how to use the formula, but in practice problems of this kind are solved by the use of the Gas-Flow Computer referred to in the answer to question No. 219.

A Size of Pipe Problem

221. The length of a certain run of main is one mile. For the first quarter mile a maximum of 15,000 cubic feet of gas per hour must be carried; from the quarter to the half mile, 12,000 cubic feet per hour must be carried; from the half to the three-quarters, 8,000 cubic feet per hour must be carried, and the amount delivered at the end of the run must be 5,000 cubic feet per hour. The gas has a specific gravity of 0.53; the loss of pressure should be uniform along the line; the total loss should not exceed 5-10 in., and the pipe rises 60 feet in the mile of run. Calculate the size of pipe required for each section.

Ans. As the pipe rises 60 ft. in the mile of run and the specific gravity of the gas is 0.53, there would be, if the main were delivering no gas at all, a gain of pressure equal to 0.4 in. of water at the delivery end of the pipe (see the answer to question No. 306). Therefore the effective loss in pressure available for causing the gas to flow through the main will be 0.5 in. + 0.4 in. = 0.9 in., and as the loss is to be uniform throughout the mile, there is an allowable loss of 0.225 in. for each quarter mile.

Applying the formula for the flow of gas in pipes we have for the first section,

Q = 15,000
d = ?
p = 0.225
s = 0.53
l = 440

Therefore, $15{,}000 = 1{,}350 \sqrt{\frac{0.225d^5}{0.53 \times 440}}$. Dividing both sides of the equation by 150 and performing the multiplication indicated in the denominator of the fraction, this becomes $100 = 9 \sqrt{\frac{0.225d^5}{233.2}}$.

Squaring this we have $10{,}000 = 81 \times \frac{0.225d^5}{233.2}$ from which we obtain $d^5 = \frac{2{,}332{,}000}{81 \times 0.225} = \frac{2{,}332{,}000}{18.2}$ = 128,131 and d = 10 + in.

For the second section,

Q = 12,000
d = ?
p = 0.225
s = 0.53
l = 440

Therefore, $12{,}000 = 1{,}350 \sqrt{\frac{0.225d^5}{233.2}}$ and reducing $80 = 9 \sqrt{\frac{0.225d^5}{233.2}}$. Squaring this we have $6{,}400 = 81 \frac{0.225d^5}{233.2}$ from which we obtain d^5 = 82,004 and d = 9 + in.

For the third section,

Q = 8,000
d = ?
p = 0.225
s = 0.53
l = 440

(Forty-first Installment will be published in October 18th issue)

SELL WINTER HOME COMFORT BEFORE YOU SELL GAS HEATERS

(Continued from page 902)

weather play safe. Install a gas heater now."

"Gas Heaters—Radiantfire type for fireplace or portable use."

"A variety of designs and sizes to suit any requirements. Specially priced while these particular styles last."

These showcards were supported upright on iron stands like music rests.

Light in the Darkness

Now and then we see a window which gets its point over entirely without the use of "props"—furnishings. Such an effort was that in evidence in Derby, Conn., by the Derby Gas Company. When we viewed the window late one autumn night it was in total darkness except for one object—a radiantfire gas heater at the middle of the exhibit. The light streaming forth from this heater afforded a striking suggestion of warmth, and we would have liked to have been within its range on that chilly autumn night. There were other gas heaters about the sides, but none of these were lighted.

A Striking Heater Demonstration

Anybody under the false illusion that a gas heater does not throw out much heat could not fail but be impressed by the convincing exhibit put in by the Bradford Corporation Gas Department, Bradford, Yorks., England. A gas heater (not turned on) was placed about a foot away from the window glass. The plate glass frontage was made to appear badly broken by the usual plan of fastening pieces of broken glass on the pane, and marking the glass to represent cracks. A nearby showcard pointed out that the heat from the gas appliance, if turned on, would be sufficient to break the glass in the manner indicated.

The Ideal Display Team-mates

Andirons and gas heaters also form an admirable team in suggesting winter home comforts. With the revival of the open fireplace in so many of our best homes, the gas log has been found the most practical way of heating, especially in the city, where cord wood is so hard and expensive to obtain.

We have corralled three such displays in the hope they may prove suggestive to you in your show window work.

A Pleasing Fireplace Scene

J. S. Mitchell & Co., Sherbrooke, Quebec, Canada, introduced a realistic fireplace scene. The entire rear and sides were laid out in oak panelling, with a brick fireplace (imitation) at the center rear. A gas log fire here burned brightly. All the fireplace fixings were of brass, with screen, tongs and andirons. There was a fireplace seat of brass and brown leather, while in front of the fire sat a large brown dog, a pottery specimen. On the mantel was a clock, bowls and vases, all of brass. It made a perfect study in brown and gold and the wares were shown off to good effect.

Showcard Appeals

The home atmosphere in the trim devised by the Wire Store, New Haven, Conn., was confined to the showcard route. These cards read as follows:

"The Hearth is the family gathering place. Make it attractive."

"Fireplace Fixings that are indispensable to the beauty and comforts of the open hearth."

Different kinds of andirons were grouped about the rose taffeta floor.

A Cheery Setting

"Cheery Accessories for the Open Fireplace"—this was the showcard message given prominence in the andirons window at Bamberger's, Newark, N. J. At the rear center, placed against a green plush drape, was a mahogany screen, with a brass fire guard in front of it. At each far side of the layout several gas logs rested on wire supports, with andirons correctly grouped about them. Each such unit was finished off with a brass fender, with a set of brass tongs and shovel flanking the same.

Conclusion

After your windows have gotten in their deadly straight-as-the-arrow work about winter home comforts, you will have people coming into your showrooms to "talk turkey" about gas heaters. Find out for what use the heaters are intended and you can then advise the most suitable ones to use. There is a lot in getting the consumer's viewpoint and giving him or her the benefit of your wide experience, for, if they buy, in their ignorance, an unsuitable gas heater for the desired purpose, they will be off gas heaters for life. Such a sale may do untold damage, especially in the amount of damaging propaganda the consumer will spread to her circle of friends and acquaintances. A little more care and consideration at the beginning and this will be avoided.

ANNOUNCEMENT

Due to the fact that the next issue, dated October 11, which will be distributed at Atlantic City, as well as regularly through the mails, will contain a story of gas, the forty-first installment of the Catechism and of the Industrial Gas Lessons will be omitted, and printed in the issue of October 18.

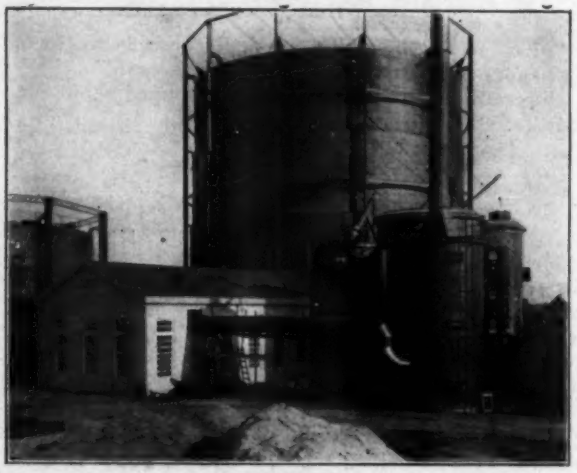
THE WORKINGS OF A GAS COMPANY

(Continued from page 904)

attention, as well as to indicate any discourtesy on the part of the employees of the company. This survey has been entirely completed, and indicates a remarkably satisfactory attitude on the part of the customers.

Visits to the Works

During 1923 a large number of consumers, representative men in all lines of business, were afforded



The Fresno Plant, Pacific Coast Gas & Electric Co., New Exhauster and Blower Building

an opportunity of first hand observation of the company's properties and organization, this being accomplished by means of trips to power houses, substations, etc. This plan has proven the correctness of the adage: "Seeing is believing," for it was demonstrated that the visitor is almost invariably impressed with the magnitude of the company's various developments and obtains a better idea of what the public utility companies in general have actually accomplished and the important part they are taking in the industrial development of the community. These trips focus the attention of the visitor on the things the company has done, and is doing, in order to discharge its responsibility for adequate service imposed upon it as a public utility.

The above is but a brief outline of the service sales program. It is being modified and expanded as changed conditions and experience dictate. It is fundamentally sound, and is rapidly proving itself a constructive instrument for maintaining and improving the service ideals.

Maintaining Sales Records

To aid in the effective work of the sales force there has been inaugurated a prospective new business system, which contains accurate information on all prospects whose annual revenue is estimated to be over $250 per year. There is being received an average of sixty electric prospects and thirty gas prospects of this size every week, whose total estimated annual revenue aggregates $150,000. On January 1, 1924, there were on record gas prospects with an estimated annual consumption of 370,000,000 cubic feet of gas, with an annual estimated revenue of $320,000. The company did not close all of these prospects, but they did know who did and why they failed, which is of great value in making the sales efforts more effective.

RATE STRUCTURE FOR SELLING GAS

(Continued from page 908)

the three-part rate, consisting of a customer charge, a demand charge and a gas charge.

The customer charge consists of the expense of bookkeeping, billing, collecting, setting, removing and repairing meters, gratuitous complaint service, office rents, meter reading, and other expenses, and a part of the fixed charges on the physical property. The aggregate of these various customer expenses will be identical for all customers, regardless of whether they use gas in small or large amounts or no gas at all.

Demand Charge

The demand charge consists of that part of company expense incidental to providing and maintaining a production, transmission and distribution system of sufficient capacity to render service as required. The principal elements in this cost are the fixed charges, among which are interest, taxes and depreciation on the necessary plant, and part of the operating and maintenance expense of the physical property. The demand charge is distributed among the customers in proportion to the demand which is contracted for by each customer, and hence in the proportion which each customer contributes towards the creating of the total demand expense.

Gas Charge

The gas charge is that part of the cost of producing, transmitting and distributing the gas which is proportional to the amount of gas handled. It represents the cost of the gas plus a certain proportion of the cost of maintaining and operating a transmission and distribution system. In other words, it is the cost of the commodity delivered, as distinguished from the cost of the service.

Instead of automatically charging some customers more than the cost of the service in order to make up for losses occasioned by supplying a goodly percentage of customers at less than the cost of the service, as is generally the case where a utility uses a straight rate, the three-part rate, if properly based on the actual investment and operating costs, will eliminate the unprofitable customers and will enable the utility to secure new business at a profitable rate, business that cannot be secured on a straight rate which is always based on averages.

Current Market Prices

COALS (By Courtesy of Coal Age)
A. Bituminous.

(Spot prices, F. O. B., mines, net tons).

High Volatile, Eastern	Market	Price
Pool 54-64 (Gas Standard)	New York	$1.40 to $1.65
Pittsburgh screened gas	Pittsburgh	2.30 to 2.50
Pittsburgh gas, mine run	Pittsburgh	2.00 to 2.25
Kanawha lump	Columbus	2.00 to 2.25
Kanawha mine run	Columbus	1.30 to 1.55
West Virginia lump	Cincinnati	2.50 to 2.75
W. Virginia gas mine run	Cincinnati	1.50 to 1.75
Midwest		
Indiana 4th vein lump	Chicago	3.00 to 3.25
Indiana 4th vein mine run	Chicago	2.25 to 2.50
South and Southwest		
Big Seam lump	Birmingham	2.50 to 3.25
Big Seam mine run	Birmingham	1.50 to 1.75
Southeast Kentucky lump	Louisville	2.75 to 3.25
Southeast Kentucky mine run	Louisville	1.35 to 1.75

B. Anthracite.

(Spot prices F. O. B. mines, gross tons),

Market	Freight rates	Independent	Company
Egg New York	$2.34	$9.25 to $9.75	$8.75 to $9.25
Egg Philadelphia	2.39	9.00 to 9.70	8.80 to 9.25
Egg Chicago (net tons)	5.06	8.17 to 8.27	8.14 to 8.20

COKE (By Courtesy of Iron Trade Review).

Connellsville, furnace	$3.00 to $3.25
Wise County, furnace	3.75 to 4.50
Alabama, furnace	4.50 to 5.00
Foundry, Newark, N. J., del.	10.41
Foundry, Chicago, ovens	10.75
Foundry, Boston, delivered	11.50
Foundry, St. Louis	11.00
Foundry, Granite City, Ill.	9.00
Foundry, Alabama	5.00 to 5.25

PETROLEUM (By Courtesy of Oil, Paint & Drug Reporter)

(Prices at wells, per bbl.)

Pennsylvania—Ohio—West Virginia.	
Cabell, West Virginia	1.45
Corning, Ohio	1.65
Lima	1.58
Pennsylvania	$2.75 to 2.85
Wooster, Ohio	1.40
Indiana—Illinois.	
Illinois	1.38
Indiana	1.39
Oklahoma—Kansas.	
Healdton	.90
Mid-continent (low gravity	.85
Gulf Coast.	
Gulf Coast, Grade A	$1.25
Gulf Coast, Grade B	1.05

GAS OILS.

Gas Oil, Bayonne, bulk gal.	5¼ to 5½c
Gas Oil (32-36) Oklahoma, gal.	3 to 3⅛c
Gas Oil (32-36) Gulf Coast, gal	3¼ to 4 c

PIPE AND FITTINGS—CAST IRON GAS PIPE.

(By Courtesy Iron Trade Review.)

Four-inch, Chicago	$61.20 to $62.20
Six-inch and over, Chicago	57.20 to 59.20
Four-inch, Birmingham	54.00 to 55.00
Six-inch and over, Birmingham	50.00 to 51.00
Four-inch, New York	69.60 to 71.60
Six-inch and over, New York	64.60 to 65.60
Standard fittings, Birmingham, base	115.00

6 to 24-inch, base; over 24-inch, plus $20; 4-inch, plus $20; 3-inch, plus $20.

BY-PRODUCTS

(By Courtesy of Oil, Paint and Drug

Ammonia aqua, 16 deg. drums lb.	5 to 5¼c
Ammonia aqua, 20 deg. drums lb.	6¼ to 6½c
Ammonia aqua, 26 deg. drums lb.	6½ to 7 c
Ammonia squa, anhydrous cylinder, lb.	30 to 36 c
Ammonium sulphate, bulk F. O. B. Works, per 100 lbs.	$2.60 to $2.65
Potash prussiate, yellow casks, lb.	17 to 17½c
Potash prussiate, red casks, lb	37 to 38 c
Soda prussiate, yellow casks,	9½ to 10 c
Soda sulphocyanide, barrels, lb.	45 to 55 c

COAL TAR BASIC PRODUCTS.

(By Courtesy of Oil, Paint and Drug Reporter)

Benzol C. P. tanks, works, gal.	24 to 25c
Benzol, drums, gal.	30c
Benzol, 90% tanks, works, gal.	23c
Benzol, 90% drums, gal.	28c
Napthalene, flake, barrels, lb.	4½ to 5 c
Napthalene, dyestuff bags, lb.	4½ to 5 c
Solvent Naphtha, water white works, gal.	24 to 25c
Solvent Naphtha, drums, works, gal.	29 to 30c
Toluene, C. P. tanks, works, gal.	31c
Toluene C. P. drums, works, gal.	36c

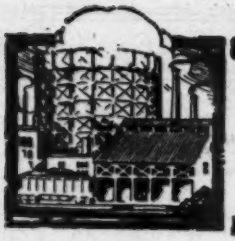
Coal

Further improvement marked the bituminous-coal market during the last week. In keeping with general business conditions, much of the increase is seasonal, and extreme caution is in evidence throughout the trade. Such barometers of trade as freight-car loadings, however, are indicative of healthy conditions. Advancing prices are due largely to domestic demand, offset somewhat by a tendency toward softness in slack.

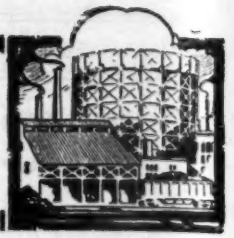
Output of bituminous coal continues to show marked improvement, the total for the week ended Sept. 20, according to the Geological Survey, being estimated at 9,902,000 net tons, an increase of 373,000 tons over the week ended Sept. 13, when 9,529,000 tons was produced, according to revised figures. Production is now at the highest level reached since the first week of March. Anthracite output also gained during the week ended Sept. 20, totaling 1,851,000 net tons, compared with 1,820,000 tons during the previous week.

Gas Oil

Gas oil was slow for the week, holding at 5c. to 5¼c. per gallon, in bulk, f. o. b. Bayonne. Increased foreign consumption of gas and fuel oil is indicated by Department of Commerce statistics for August, showing exports of 971,459,292 gallons during the first eight months of 1924, an increase of 197,145,811 gallons, or 25 per cent, over the exports during the corresponding period of 1923. Exports of gas and fuel oil during August were 141,651,739 gallons, as compared with 114,762,945 gallons in August of 1923.



NEWS OF THE GAS INDUSTRY



Pacific Coast Gas Assn. Holds Annual Meeting

Many Papers Feature the Meeting

Clyde H. Potter

The Pacific Coast Gas Association, comprising gas companies of the far western states, California, Oregon, Washington, British Columbia, Arizona, Nevada and distant Hawaii, held its annual convention at Santa Barbara, California, from September 15 to 18, marking one of the most successful gatherings in the 31 years during which the association has existed. Successful not only in the great number of delegates that attended, for 350 representatives and their wives registered, but successful in the high character of papers presented and discussed.

Meeting Opened by Pres. Basford

Following the early registration of Monday morning, the first official meeting of the 31st convention was opened by President Harold R. Basford. In a spirited address Basford reviewed the activities of the industry during the past year, pointing with pride to the many accomplishments. The many problems before the association were summed up by the speaker as follows:

1. Organization.
2. Committee personnel.
3. Scope of committee activities.
4. Possibility of board meetings.
5. Sectional gatherings.
6. The necessity of a headquarters office with a paid secretary devoting all his time to the office.
7. Finance—the necessity of a budget.
8. Revising the constitution and by-laws.
9. The necessity of testing gas appliances.
10. Contact with the American Gas Association.
11. Finally, disposing of the gas engineering fund.

In referring to the subject of municipal ownership, President Basford said, in part:

Municipal Ownership and Public Ownership

"In touching upon the subject of municipal ownership of public utilities, it is very difficult, indeed, to bring in a message such as this the vital picture because of the many sided opinions on the subject, together with the far-reaching effects of such operations, both past and future. The subject is so vital that I beg your forebearance, while I touch briefly upon some of the high lights of the question as I see it.

"Public ownership—by which I mean capital investments, owned in small parcels by large numbers of private individuals, is the only true public ownership.

"If every user of utility commodities owned stock in them, we would have little talk of municipal ownership. Every effort should, therefore, be made to bring about this condition as near as possible. It is again a credit to us that a member of this body, Mr. A. F. Hockenbeamer, fathered this idea.

"Gas companies so far have been little molested—yet within the year one of our larger community utilities has been taken over, and with this gate opened more will attempt to follow.

"Everybody's business is nobody's business. To my mind municipal ownership tears down every ideal and economic law which has builded us as a nation. Individual effort and initiative is killed.

"If it were possible, and it is not impossible, so to socialize the entire business of the nation, nothing could be created to add to the taxable wealth, and all taxable wealth would become untaxable to the utter ruin of our national or personal fabric."

The president concluded his address by thanking the members of his administration for the untiring support given to him during the year closing.

The next order of events was the secretary's report, read by Assistant Secretary Clifford Johnstone. Followed a report of the chairman of the publicity committee by F. S. Myrtle of San Francisco.

John Clements' Paper Is Read

Then followed a new event in the annals of the association. For thirty years John Clements of San Francisco has presented a talk on "Experience." This year Clements is considerably past the 80-year mark and was not present. In his absence, William Baurhyte, president of the Los Angeles Gas & Electric Corporation, a life-long friend of Clements, read a paper sent to the convention by the absent man. It was a solemn moment in the association's history. Following Baurhyte's reading of Clements' paper, President Basford was instructed to telegraph the association's best wishes to the venerable member of the fraternity, Clements, who for thirty years never missed a convention.

Election of Officers

The annual election of officers followed. The new officials and board of directors elected were as follows:

E. L. Hall, Portland Gas & Coke Company, Portland, Ore., president; Fred J. Schafer, assistant general manager, Southern California Gas Company, Los Angeles, vice-president; and Clifford Johnstone, assistant secretary,

elected secretary, succeeding William Henderson, for the past four years, the hard-working secretary of the association.

Directors: H. R. Basford, outgoing president; A. B. Day, vice-president and general manager, Los Angeles Gas & Electric Corporation; W. S. Yard, Pacific Gas & Electric Corporation, San Francisco; George E. Whitwell, Tacoma, Wash.; J. E. Kelley, Western States Gas Company, Stockton, Cal.; S. M. Hutchinson, Seattle, Wash., and H. M. Crawford, Pacific Gas & Electric Corporation, San Francisco, Cal.

C. O. G. Miller, president of the Pacific Lighting Corporation, a director of the Pacific Gas & Electric Corporation and vice-president of the American Gas Association, attended the opening session and read a welcome to the delegates in behalf of the American Gas Association.

Sections Meet

On Tuesday morning the convention began its sectional work in earnest. Two parallel sections began activities, the Commercial section, under the able chairmanship of L. F. Galbraith of San Francisco, and the Accounting section, under the guidance of C. W. Platt of Portland, Oregon. In the former section two highly interesting talks were made by men not of the gas industry. A. L. Crane, a highly trained appliance expert, whose life has been devoted largely to advertising the furniture business, talked on "Merchandising Methods." Crane's presentation was strikingly illustrated with slides which vividly portrayed the proper and the improper ways of merchandising. This was Mr. Crane's second appearance before the association and he was warmly received.

N. B. Drury, an advertising specialist of San Francisco, presented a paper on "Making the Public Think About It." Drury showed that he knew the fundamentals of advertising and he proposed a plan of advertising the gas industry on the coast which proved of interest to all present. He also made a report of the Advertising Bureau. Interesting extemporaneous discussion followed, in which several delegates participated.

Accounting Section Meets

In the Accounting section equally interesting papers were being presented and discussed. M. J. Wilkinson, chairman of the Committee on Utility Statistics, read a paper on "Gas Utility Statistics." He also presented his report as chairman of that particular committee.

O. L. Moore, auditor of the Los Angeles Gas & Electric Corporation, followed with a talk on "Gas Utility Budgets." Moore was chairman of the Committee on Budgetary Control for the association. He made a report on the work of this committee. Moore has on several occasions appeared before the association and his knowledge of his subject was of interest.

A third paper was presented by D. G. Martin, chairman of the Committee on Cost Accounting. His paper was on this subject, "Keeping Costs." The report of the Cost Accounting Committee was made by Martin. Participation in the discussion was general by the delegates.

Three-Minute Speaking Contest

At the noon luncheon, held in the dining room of the Arlington Hotel, one of the high lights of the 31st convention took place. Under the auspices of L. F. Galbraith, chairman of the Commercial section, a three-minute speaking contest, similar to the contests held annually by the Pacific Coast Advertising Clubs, was held. This proved to be one of the most novel events of the annual gathering. The judges of the speaking engagement were the Mayor of Santa Barbara, Hon. C. M. Andera, and two prominent business men, James D. Lowsley, vice-president of the First National Bank, and W. A. French, manager of the Industrial Loan Company of Santa Barbara.

Strict rules governed the contest. Exactly three minutes were allotted for the presentation of the subject, a gong starting and stopping the speakers on the second. A speaker who attempted to talk over his allotted time was called by the chairman.

C. B. Babcock of San Francisco acted as chairman and introduced the nine contesting speakers. The

The Gas Men at the Pacific Coast Gas Association Convention.

subject discussed by the gas men was "The Value of a Sales Force to a Gas Company." The subject was ably handled and the judges found some difficulty in making their decision.

First Prize Awarded to E. E. Jones

E. Earl Jones, assistant sales manager of the Portland Gas & Coke Company, was awarded first prize, a beautiful mantel clock. Honorable mention was also given to F. H. Bivens, of the Southern Counties Gas Company, Los Angeles. The other seven speakers were F. U. Naylor, San Francisco; Frank Cannon, manager of the Honolulu Gas Company; Frank Weiss, manager new business department, Los Angeles Gas & Electric Corporation; George E. Whitwell, Tacoma Gas & Fuel Company; J. T. Sullivan, Reno, Nevada; W. E. Hendrick, Los Angeles, and M. K. Griffith, Stockton, Cal.

So popular did this speaking contest prove that it was agreed by delegates and officials alike that the three-minute event would become an annual feature of the conventions.

Technical and Commercial Sections Meet

At 2 p. m., the parallel sessions of the Technical and Commercial sections were resumed, the former being in charge of W. S. Yard of San Francisco. Speakers before the Technical section were as follows: Ray S. Fuller, chairman of Committee on Unaccounted-for Gas, "Sources of Leakage," and a report on the activities of his committee; C. R. Miller, chairman of the Committee on Consumers' Meters, "Meter Statistics," together with a report on his committee's work for the year; R. M. Conner, chairman of the Committee on Appliance Testing, "Status of Appliance Testing Code," and a report of the committee work; Walter M. Berry, "Carbon Monoxide," and a demonstration of the Pyrotannic Test; and a paper by Otto Goldkamp of San Diego on "Tests for Pipe Fittings."

S. P. Duckel concluded the afternoon program in presenting a paper on "The Use of Compressed Air in Construction Work." Open discussion was a part of the day's order and interesting points were presented by a number of the attending delegates.

Suggestions on Gas Range Given

In the parallel Commercial section, equally important matters were under discussion. One of the features of the convention was the addition of Kate Brew Vaughn, director of Home Economics Department, Los Angeles Evening Express. Miss Vaughn presented a highly interesting talk on "What the Housewife Expects in Purchasing a Gas Appliance." A colorful event it was to have this foremost authority on cookery presenting her points to the gas fraternity, and many valuable suggestions were made by Miss Vaughn in certain alterations to appliances. She has been an instructor of cooking for 25 years and has lectured and taught in all parts of the country. She did not hesitate to tell the appliance representatives and stove manufacturers present what she desired or did not desire in the stoves turned out today by the industry and undoubtedly Miss Vaughn's suggestions, coming from one who knows the housewife probably better than any other instructor in Southern California, may have an effect on certain suggested stove improvements.

Other speakers on the Commercial program were W. M. Henderson, retiring secretary of the association, now with the Los Angeles Gas & Electric Corporation, chairman of the Home Service Bureau. Henderson presented an interesting paper on "The Responsibility for Service," which developed considerable discussion. J. H. Gumz, chairman of the Industrial Utilization Bureau, was the last speaker of the session. He talked on "Industrial Markets for Gas."

Theater Party Tuesday Evening

On Tuesday evening a large delegation of conventionites attended a theater party at the newly erected Granada Theater, the program having been specially arranged for the occasion.

Wednesday morning marked a resumption of the sessions of the Technical and Accounting sections under the direction of Chairmen W. S. Yard and C. W. Platt. Both programs lasted a full three hours, starting at 9:30 and closing at 12:30 o'clock. The speakers before the Technical session were as follows:

K. C. Tomlinson, chairman of the Committee on Naphthalene Removal; F. U. Naylor, for H. M. Crawford, chairman of the Committee on Standardization and Testing of Gas Appliances; Ray S. Fuller, Pacific Gas & Electric Corporation, and R. M. McCalley. Tomlinson read a paper on "Oil Scrubbing."

Naylor followed with Crawford's prepared paper on "Gas Appliance Standards," which created a great deal of interest and discussion. It was brought out by Mr. Naylor that Crawford, on behalf of his committee, has visited Washington, D. C., and New York City, where he has conferred with experts of the industry in the East.

Ray Fuller presented a paper on "Comparative Cost of High Pressure and Low Pressure Distribution." The session was closed with a paper by McCalley on "Welded Mains for Low Pressure."

Wednesday Accounting Meeting

In the Accounting section, under the chairmanship of C. W. Platt of Portland, Oregon, the following speakers contributed to the Wednesday morning program:

F. L. Nagel, chairman of the Committee on Contracts and Work Orders, spoke on "Office Efficiency." Frank Ingram, chairman of the Committee on Customers' Bookkeeping, presented a paper on "Keeping Track of Customers' Accounts," and J. E. Murphy, chairman of the Committee on Credits and Collections, spoke on this subject, "The Financial Side."

The Accounting session closed in time to permit the delegates to participate in the association luncheon.

Athletic Events

All sessions were put aside on Wednesday afternoon for a series of athletic and outing events, in which both the men and lady delegates participated. The lady delegates were taken in automobiles for a beautiful drive through the scenic Montecito suburbs and to the famous Knapp estate. The men, in the meantime, were participating in the annual golf tournament, competition being principally for the Babcock-Pederson-

Basford Challenge Cup and incidentally for a number of prizes of lesser note. Other delegates joined in motor trips, swimming parties and visits about the city. At 4 o'clock all of the delegates, men and women, met at the Los Banos del Mar, where aquatic sports were a feature. There were men's races, women's races, a water polo game and other water sports, in which many of the gas delegates proved to be quite clever.

The Convention Ball

The annual convention ball took place at the Arlington on Wednesday evening and was one of the colorful features of the annual gathering.

Thursday, the last day of the convention, proved to be the most important one of the four-day period. During the morning hours there was a general session of all delegates under the auspices of the Public Relations section, a record-breaking attendance crowding the hall. This important program was in charge of D. C. Ray, of the Commercial Department of the Pacific Gas & Electric Corporation of San Francisco.

That public relations is a subject of growing importance in the gas industry of the West is evidenced by the high character of the papers presented at this session and by the interest taken in this meeting. The speakers indicated that many months' study had been devoted to their respective subjects.

Papers on Public Relations

The first paper was presented by W. H. Barton, of the Portland Gas & Coke Company, who was chairman of the Committee on Employees' Relations with the Public. His subject was as follows: "Your Contract with the Public."

The second speaker was Frank A. Easton, chairman of the Committee on Customer Ownership, who represented the San Joaquin Light & Power Corporation. Easton spoke on "Customer Ownership," and showed a thorough knowledge of the subject. He presented some interesting figures on the success of customer ownership, not only among California utilities, but among more than 200 public utilities throughout the nation. He also stressed the fact that customer ownership originated in California.

Arthur F. Bridge, rate engineer of the Southern Counties Gas Company, followed. As chairman of the Committee on Rates and Tariffs, Bridge's talk dealt with this subject, "Science versus Simplicity in Rates."

C. A. Luckenbach, a vice-president of the Los Angeles Gas & Electric Corporation, followed with a paper on "Educating the Public." For the past year Luckenbach has been chairman of the Committee on Information for the association, and his presentation showed that many months had been spent in putting his paper into shape.

G. P. Egleston, of the H. R. Basford Company, San Francisco, followed. Egleston set forth the history and purpose of the Gas Appliance Society of California, an organization of gas appliance dealers, manufacturers and gas companies. Egleston is the chairman of the association committee on Contact with Gas Appliance Dealers.

"Accident Prevention and Welfare" was the subject presented by J. P. Coghlan, chairman of the Committee on Management.

The closing talk of the morning session was made by E. G. McCann, manager of the Personnel Department of the Pacific Gas & Electric Corporation of San Francisco. His subject, an interesting one, after which a number of delegates spoke, was "Human Relations as a Function of Management."

Following a period of discussion the morning session was declared closed by Chairman Don C. Ray.

More than 300 delegates then assembled on the lawn in front of the Arlington Hotel, where the convention photograph was taken.

Final Meeting of Technical Section

On Thursday afternoon the final meeting of the Technical section was held, with W. S. Yard, of the Pacific Gas & Electric Corporation, acting as chairman. William Moeller, Jr., of the Midway Gas Company, presented the first paper, as follows, "Measure of Gas Under High Pressure." Moeller for the past year has been association chairman of the Committee on Natural Gas. A paper on "Soil Corrosion" was then read by H. S. Christopher. "Internal Corrosion," an equally interesting topic, was set forth by W. V. Watson. Technical section session was closed by M. J. Cereghino, of the Los Angeles Gas & Electric Corporation, with a paper on "Firebrick and Refractories."

Immediately following the above session, retiring President Basford called a general business session of the association, a large attendance of delegates being on hand. A few odds and ends of unfinished business were cleared up by the outgoing administration. Then followed the report prepared by Chairman H. M. Crawford on the work of the Gas Engineering Degree Committee. It was moved that the remaining fund be used by the University of California for the purchase of any additional equipment needed.

Followed the report of the Resolutions Committee, of which L. M. Klauber of the San Diego Consolidated Gas & Electrical Corporation was chairman. A number of important resolutions were submitted and adopted.

The Annual Banquet

The final event of the Santa Barbara convention was the annual banquet, which was held in the dining room of the Arlington on Thursday evening. Close to 400 delegates, wives and friends crowded the large room. Following the usual merriment and program features, retiring President H. R. Basford opened the ceremonies. He thanked the association for the support given his administration and before retiring pinned the President's pin on the lapel of E. L. Hall, of Portland, the incoming executive. Hall made a brief address, following which the new officers and directors of the association were presented.

Charles H. Dickey of New York City extended an address of welcome to the ladies. William Baurhyte of Los Angeles talked on the "Spirit of the Convention," following which he made the presentation of several awards to the speakers of the convention presenting the best papers. These in-

cluded K. C. Tomlinson of the Technical committee, Ray S. Fuller, N. B. Drury and others. L. F. Galbraith, chairman of the Commercial section, was awarded a prize for the best sectional program at the 1924 convention.

Dan J. Young and George Whitwell of Tacoma were given special honor by the convention for their achievement in developing a new water gas manufacturing process, called by Baurhyte, "a great contribution to the industry," and presented them with an embossed seal setting forth the appreciation of the association.

Followed the golf tournament awards made by W. M. Thompson, chairman of the golf committee. It was a lucky night for the Pauls, Paul Haugh taking away the Arlington Hotel trophy and Paul Overton of the Los Angeles Gas & Electric Corporation winning the Babcock - Pederson - Basford Challenge Cup. Other winners who succeeded in taking away trophies were A. C. Thompson, F. W. Hunter, F. A. Rasch, Frank H. Bivens, Joe Moore, J. S. Strumm, Martindale, and C. B. Babcock, the latter claiming the booby prize.

R. E. Fisher, manager of the Commercial Department of the Pacific Gas & Electric Corporation, spoke briefly on "Public Relations."

James W. Foley Entertains the Gas Men

Then came the treat of the evening, a humorous address given by James W. Foley, well-known Southern California poet and newspaperman. Foley is a writer of many poems and his work is well known throughout the West. In his address, which was well punctuated with humor and comedy, he stressed the points of cooperation between the employer and the employee, the ability of man to retain a bit of humor under all conditions, and urged the employer "to put himself in the other fellow's place." Foley's talk was easily one of the high lights of the convention and it was said that he provoked more laughter and genuine humor in the short space of an hour than any previous convention speaker had done.

Foley's address concluded the program for the night and following an informal dance the 1924 convention was formally brought to a close.

The Ladies' Program

In addition to the business sessions for the men delegates, a unique program for the ladies proved a success. The ladies' committee, comprising Mesdames Frank Talcott, M. K. Miller, Jr., Norman R. McKee, Frank H. Bivens, C. E. Rutledge and F. E. Seaver, had charge of this feature. From the time the convention opened on Monday to the closing hour there were a series of entertaining numbers especially arranged for the lady delegates. Dancing parties, teas, trips through the beautiful Hope ranch, a party at Samarkand Hotel, drives through Montecito and other beauty spots of Santa Barbara contributed to make the 1924 convention especially enjoyable to the ladies.

Public Utility Advertising Exhibits

A new feature added this year was the public utility advertising exhibit placed in the lobby of the hotel. Specimens of practically all coast gas companies were exhibited. The utilities submitting copy for the exhibit were as follows:

British Columbia Electric Railway Company, Cadman Manufacturing Company, Geo. M. Clark Company, Coast Counties Gas & Electric Company, Coast Valleys Gas & Electric Company, Los Angeles Gas & Electric Corporation, Pacific Gas & Electric Company, Portland Gas & Coke Company, Riverbend Gas & Water Company, San Diego Consolidated Gas & Electric Company, San Joaquin Light & Power Corporation, Santa Maria Gas Company, Southern California Gas Company, Southern Counties Gas Company, Spokane Gas & Fuel Company, Tacoma Gas & Fuel Company, Western States Gas & Electric Company, Pacific Power & Light Company, Pittsburgh Water Heater Company, James Graham Manufacturing Company, Bryant Heater Company, Welsbach Company, Sacramento Gas Company, Ruud Water Heater Company, Truckee River Power Company, Victoria Gas Company, Hammer-Bray Company and the E. S. Hoyt, Jr., Company.

Two New Bulletins

The Precision Thermometer and Instrument Company, Philadelphia, Pa., has just issued two new catalogues, one designated as Bulletin "C" and one Bulletin "E." Bulletin "C" covers their line of test thermometers, laboratory thermometers and hydrometers, hygrometers, barometers, vacuum gauges and tank gauges. Bulletin "E" covers their line of technical thermometers and their complementary instruments, anemometers and special instruments.

Both bulletins are printed on heavy coated stock, freely illustrated and contain a vast amount of information on the uses and care of their various instruments. A copy of the bulletins will be sent on request.

J. Wallace Graham, secretary and general manager of Kitson Company, Philadelphia, Pa., died suddenly on September 10, 1924.

Mr. Graham was a well known figure for a number of years at Eastern Supply Assn. meetings and other similar occasions where he was universally regarded with esteem and good will.

He was born in Philadelphia, Pa., October 20, 1866. After passing through school he was associated with his father, John Graham, in the tapestry manufacturing business at 19th and Hamilton streets, Philadelphia, Pa.

In 1898 he was given a clerical position with the Kitson Company, but shortly afterwards was made manager of the lamp department, which position he held until January 1, 1910, at which time he assumed the duties of general manager.

During September, 1923, the Kitson Company moved to their new building at Westmoreland and Stokley streets, and the location and laying out of the plant was due to the administrative and mechanical ability of Mr. Graham.

He was a member of the Union League, the St. Andrews Society and the Undine Barge Club of Philadelphia.